the change from the slate to the adinole, an actual addition of material from the igneous rock has taken place.

The Granitic Rocks of the Sierra Nevadas.—Turner[1] describes the granular complex of the central and southern Sierra Nevadas as comprising nearly the entire range of plutonic rocks. They are associated more or less closely with gneisses, some of which may be sedimentary while others are igneous. Among the rocks belonging in the granite family the author distinguishes seven types, a biotite granite, a granodiorite, a quartz monzonite, both in porphyritic and in non-porphyritic phases, soda-granite, aplite, potash-aplite, pegmatite, and a type designated as the bridal veil granite.

The granodiorites constitute a portion of a huge batholite, the parts of which have been differentiated into quartz-diorites, quartz-mica-diorites, quartz-hornblende-diorites, and quartz-pyroxene-diorites, gabbros, and olivine-gabbros. Typical granodiorite is an aggregate of plagioclase (usually andesine), quartz, orthoclase, and either biotite or amphibole, or both. The quartz-monzonites contain oligoclase instead of andesine. They are more acid than the granodiorites, as shown by the analysis below. The bridal veil granite is a fine-grained white rock that often possesses an orbicular structure — the nodules consisting of a white nucleus of quartz and feldspar surrounded by a zone rich in biotite.

The aplites and soda-granites are also white rocks in which albite is the principal feldspathic component. Quartz-diorite aplites occur in dykes cutting quartz-diorite. These are regarded as genetically connected with the more basic diorite with which they are associated, just as the potash aplites are related to the granodiorites and quartz-monzonites in which these rocks occur. The feldspar of the quartz-diorite aplite is chiefly andesine.

Analyses of the most important types of rocks discussed are shown in the following figures:

	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	CaO	MgO	K_2O	Na_2O	H_2O	P_2O_5	Tot.
I.	70.75	.29	15.51	.85	1.34	2.82	.55	4.28	3.11	.46	.10	= 100.34
II.	65.48	.52	16.05	1.47	3.06	4.88	2.13	2.43	3.49	1.27	.12	=
III.	66.83	.54	15.24	2.73	1.66	3.59	1.63	4.46	3.10	.56	.18	= 100.82
IV.	74.21	.30	14.47	.35	.50	1.71	.28	.10	7.62	.38	.07	= 99.99
V.	69.66	.21	17.57	.21	1.04	4.54	.58	.71	4.91	.55	.03	= 100.09
VI.	76.00	.08	13.23	.54	.35	1.38	.09	5.40	2.74	.43	.02	= 100.37

I = average of three biotite-granites, II = average of five granodiorites, III = quartz-monzonite, IV = soda-aplite, V = quartz-diorite aplite, VI = average of two potash-aplites.

[1] *Journ. of Geology*, vol. vii, p. 141.

The totals include small amounts of MnO, SrO, BaO, and other oxides.

The Rocks of Mount Rainier. — The volcanics of Mount Rainier [1] are basaltic and andesitic lavas and tuffs, passing into one another by almost imperceptible gradations. The predominant andesite is hypersthenic, but other pyroxenes often occur with the hypersthene and sometimes replace it entirely in the rock mass. The platform upon which the volcanics were extruded consists of a granite either hornblendic or biotitic.

Luquer's Minerals in Rock Sections [2] is an attempt to furnish to students in as few words as possible an account of the practical methods of identifying the minerals occurring in rocks by means of their optical and other physical properties as they may be observed in thin sections under the microscope.

The general principles of optics are discussed in the first thirty-four pages of the book as an introduction to the description of the characteristics of the individual minerals. Unfortunately, this discussion is so condensed that it can afford no help to the student unless it is accompanied by explanatory lectures. As a summary of a course of lectures in optics it might possibly be of value. The discussion explains nothing; it is merely a dogmatic statement of facts, sometimes so bare of explanatory or illustrative phrases as to leave only a confused impression in the mind of the reader. This is particularly noticeable in the case of the definitions. For instance, the first time the term "extinction angle" is used, it is described as the angle between the axis of elasticity and the crystallographic axis, without reference in any way to the fact of extinction. There is much loose expression in this part of the book, which, of course, might easily be corrected in a new edition.

The chapter on the microscopic features of the individual minerals covers forty-five pages. Here we find a very concise description of the principal diagnostic characters of the minerals most frequently found in rocks, with brief remarks on their occurrence.

A noteworthy feature of the volume is the clear manner in which directions are given for the manipulation of the apparatus employed

[1] Smith, G. O. *Eighteenth Ann. Rep. U. S. Geol. Survey*, Pt. ii, p. 416.

[2] *Minerals in Rock Sections.* The practical methods of identifying minerals in rock sections with the microscope. By L. McI. Luquer, C.E., Ph.D. vii + 117 pp., 48 figs. Price $1.40. New York, D. Van Nostrand Co., 1898.